

REMARKS

Claims 12-37 are pending in this application. Claims 1-11 were previously canceled. Claims 12-15, 18-22, 24, 26 and 28 have been withdrawn from consideration.

Claims 16, 17, 27, 29-31, 34 and 35 have been rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,698,627 ("Oguni et al.") in view of U.S. Patent No. 4,334,013 ("Bergthaller et al."). It is alleged that Oguni et al. discloses a novel additive for papermaking comprising an aqueous solution of a copolymer obtained by reacting (a) an acrylamide, (b) a vinyl monomer which is copolymerizable with component (a) and has a cationic group; (c) at least one of vinyl monomers which are copolymerizable with components (a) and (b) and have 2, 3 or 4 carboxyl groups in a molecule thereof, and/or a salt thereof, optionally; (e) a nonionic monomer which is copolymerizable with components (a), (b) and (c) if desired; and (d) a cross-linking compound, in the presence of (f) at least one of ethylene glycol, diethylene glycol, diethanolamine and glycerin.

With regard to the limitations of claims 16 and 17, it is alleged that Oguni et al. discloses that the above-mentioned acrylamide (a) includes acrylamide, (meth)acrylamide as well as N-substituted acrylamides such as N-methyl (meth)acrylamide, N-ethyl (meth)acrylamide, N,N-dimethyl (meth)acrylamide, N-iso-propyl(meth)acrylamide, N-t-octyl (meth)acrylamide, etc., that can be used alone or in combination (col. 2, lines 39-45). The Office Action contends that these monomers correspond to monomer (b) of present claim 16.

The Office Action notes that the vinyl monomer (b) of Oguni et al. includes vinyl monomers containing tertiary, secondary or primary amino groups such as allylamine, etc., or their salts of inorganic or organic acids such as hydrochloric acid, sulfuric acid, formic acid, acetic acid, etc. (col. 2, lines 53-55), alleging that these monomers correspond to monomer (a) of present claim 16.

The Office Action notes that examples of the above-mentioned vinyl monomer (c), which is copolymerizable with components (a) and (b), include divalent unsaturated carboxylic acids such as maleic acid, fumaric acid, itaconic acid, muconic acid, citraconic acid, etc., and their salts of an alkali metal such as sodium, potassium, etc. and ammonium salts; allylsulfonic acid, 2-acrylamide-2-methylpropanesulfonic acid, etc. (col. 3, lines 8-30), alleging that these monomers correspond to monomer (c1) of present claim 16.

Further, the Office Action contends that the above monomers can be used alone or in combination (col. 3, lines 5-7, 18-20, 28-30), thus corresponding to monomer (c2) of present claim 16.

The Office Action also notes that as the above-mentioned cross-linking compounds (d), di(meth)acrylates such as ethyleneglycol di(meth)acrylate, diethyleneglycol di(meth)acrylate, triethyleneglycol di(meth)acrylate, propyleneglycol di(meth)acrylate, etc. can be used (col. 3, lines 32-62).

The Office Action alleges that Oguni et al. discloses that the above-mentioned (b) vinyl monomer includes vinyl monomers containing tertiary, secondary or primary amino group such as allylamine etc. or their salts of inorganic or organic acid such as hydrochloric acid, sulfuric acid, formic acid, acetic acid, etc. (col. 2, lines 53-55).

The Office Action acknowledges at page 4 that Oguni et al. does not disclose monomers corresponding to monomer (a).

With regard to claims 16 and 17, the Office Action asserts that Bergthaller et al. discloses copolymers obtained by polymerizing an allyl ammonium salt, a monomer containing at least one anionic group and acrylamide and/or methacrylamide are useful as peptizing agents for silver halide emulsions (abstract). Bergthaller et al. allegedly discloses: (1) new copolymers characterized by a content of copolymers of at least the following polymerized compounds: (1) an allyl ammonium salt corresponding to the formula (A):



which is allegedly analogous to formula (1) of claim 16. A_n is an anion, particularly the anion of a strong inorganic or organic acid, particularly chloride; alkane sulphonate; aryl sulphonate; trifluoroacetate; perfluoroalkanoate; perfluoroalkane sulphonate or the sulphonate group of a monomer present in copolymerized or copolymerizable form (col. 2, line 34 through col. 4, line 41).

The Office Action contends that both Oguni et al. and Bergthaller et al. are analogous art references because they are from the same field of endeavor concerning new copolymers obtained by polymerizing allyl ammonium salts, a monomer containing at least one ionic monomer, acrylamide and allyl sulfonic acid (salt) and, therefore, it would have been

obvious to one having ordinary skill in the art at the time the invention was made to incorporate an allyl ammonium salt corresponding to formula (1) as taught by Bergthaller et al. in the Oguni et al. papermaking composition with reasonable expectation of success because the compound contains an ionic group and can be easily copolymerized with an acrylamide (Oguni et al. at col. 2, lines 23-24).

With regard to the limitations of claim 27, the Office Action alleges that Oguni et al. discloses that because of the introduction of cross-linking structure by the cross-linking compound (d), the molecule expands and thus the number of contact points with fibers increases. Therefore, freeness, retention and paper-strengthening effect are enhanced (col. 4, lines 54-58).

With regard to the limitations of claims 29-31, 34 and 35, the Office Action alleges that Oguni et al. discloses that preparation of acrylamide copolymers can be carried out by any known conventional process.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

The test of obviousness is usually interpreted in view of Graham v. John Deere Co., 383 U.S. 1 (1966) by determining: (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the pertinent art. When doing so, the prior art cited by the Examiner must show that one of ordinary skill in the art at the time the invention was made would understand that the scope and contents of the prior art encompass the claims at issue.

As acknowledged at page 4 of the Office Action, Oguni et al. does not suggest or disclose monomer (a) of the presently claimed invention. The Office Action relies upon the disclosure of Bergthaller et al. for this component. However, the teachings of Bergthaller et al. are not properly combinable with Oguni et al. because it is non-analogous art.

"In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned". *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); M.P.E.P. §2141.01(a).

In this rejection, Bergthaller et al. are completely silent about papermaking agents. Since the Bergthaller et al. document is related to peptizing agents for silver halide emulsions in the field of photographic materials, it is unreasonable to conclude that an artisan

skilled in the field of papermaking would certainly have employed it as a main composition for a papermaking additive.

Every researcher endeavors to obtain new products or improve conventional products in the field of their study. The Office Action does not show the reason why Berghthaller's allyl ammonium salt corresponding to formula (1) would have been particularly selected for the additive of Oguni et al. The Berghthaller et al. reference is not in the field of Applicant's endeavor and is not reasonably pertinent to the particular problem with which the inventor was concerned. This rejection is based upon impermissible hindsight reconstruction. Applicants respectfully request that the rejection be reconsidered and withdrawn.

Claims 23, 25, 32, 33, 36 and 37 have been rejected under 35 U.S.C. §103(a) as being obvious over Oguni et al. and Berghthaller et al. as applied to claims 16, 17, 27, 29-31, 34 and 35 above, and further in view of U.S. Patent No. 5,756,646 ("Nasu"). With regard to the limitations of claims 23, 25, 32, 33, 36 and 37, the Office Action acknowledged that the combined teachings of Oguni et al. and Berghthaller et al. do not disclose that the polymerization is conducted in the presence of a urea compound. The Office Action alleges that Nasu discloses an agent for improving surface quality of paper comprising an acrylamide resin composition obtained by hydrolyzing an acrylamide resin, which is obtained by polymerizing an acrylamide monomer in the presence of a urea compound (abstract). The urea compounds include urea, thiourea, ethylene urea, ethylene thiourea, etc. One or more of these can be used in combination, and it is economically preferable to use urea alone (col. 3, lines 16-19). Therefore, the Office Action concludes that it would have been obvious to one having ordinary skill in the art when the invention was made to add urea compound as taught by Nasu during the polymerization process of acrylamide polymer composition of Oguni et al. and Berghthaller et al. to achieve excellent effect for improving surface strength, tensile strength and internal strength of paper (Nasu, col. 2, lines 37-39), and thus to arrive at the subject matter of claims 23, 25, 32, 33, 36 and 37, which renders the present claims *prima facie* in the absence of unexpected results commensurate in scope of the claims.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

As discussed above, Oguni et al. does not suggest or disclose monomer (a) of the presently claimed invention. The Berghthaller et al. reference is not properly combinable with the Oguni et al. reference since its teachings are not in the field of Applicant's endeavor and are

not reasonably pertinent to the particular problem with which the inventor was concerned. The teachings of Nasu et al. do not remedy this deficiency in the cited prior art. Nasu et al. does not suggest or disclose monomer (a) of the presently claimed invention.

In the Nasu process, the hydrolysis step is required to achieve improvement in surface strength, tensile strength and internal strength of paper. See column 2, line 64 – column 3, line 15. The paragraph states that the hydrolysis makes the acrylamide resin composition have a sequence different from the sequence of the conventional acrylamide resins, and this difference contributes to the improved surface strength, tensile strength and internal strength of paper coated with the acrylamide resin composition. Therefore, just the polymerization in the presence of a urea compound without hydrolysis will not result in the improved surface strength, tensile strength and internal strength.

In the paragraph bridging pages 6 and 7 of the Office Action, it is stated that Nasu et al. discloses an agent for improving surface quality of paper comprising an acrylamide resin composition obtained by hydrolyzing an acrylamide resin, which is obtained by polymerizing an acrylamide monomer in the presence of urea compound. The following paragraph concludes that it would have been obvious to one having ordinary skill in the art when the invention was made to add urea compound as taught by Nasu et al. during the polymerization process of acrylamide resin composition of Berghaller et al. to achieve excellent effect for improving surface strength, tensile strength and internal strength of paper.

However, Nasu et al. teach that the agent for improving surface quality of paper comprising an acrylamide resin composition is obtained by **hydrolyzing an acrylamide resin** which is obtained by polymerizing an acrylamide monomer in the presence of urea compound. The hydrolysis step is essential in the invention of Nasu et al. See col. 2, line 64 - col. 3, line 15. The paragraph states that the hydrolysis makes the acrylamide resin composition have a sequence different from the sequence of the conventional acrylamide resins, and this difference contributes to the improved surface strength, tensile strength and internal strength of paper coated with the acrylamide resin composition of Nasu et al. Therefore just the polymerization in the presence of a urea compound, without subsequent hydrolysis, will not result in the improved surface strength, tensile strength and internal strength. This important step has been overlooked.

Also, since the Berghaller et al. reference does not pertain to papermaking, the reasoning that the skilled artisan would have added a urea compound as taught by Nasu et al. during the polymerization process of acrylamide resin composition of Berghaller et al. to

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achieve excellent effect for improving surface strength, tensile strength and internal strength of paper, is not properly supported.


This rejection is based upon improper hindsight reconstruction. Thus, Applicants respectfully request that this rejection be reconsidered and withdrawn.

In view of the remarks above, reconsideration and withdrawal of the rejections and favorable allowance of all claims is respectfully requested.

Respectfully submitted,

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